Vision for The Future of Artificial Intelligence

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Apparently, reinforcement, unsupervised and supervised learnings are intertwined in the human brain (Carlson, & Birkett, 2017; Dayan, & Abbott 2001). Intertwined unsupervised and supervised learning mechanisms are responsible for synaptic plasticity in the human brain and determine brain connectivity. Reinforcement learning is responsible for many types (simple and complex) of human learning abilities in collaboration with unsupervised and supervised learning. Therefore, a vision for machine learning and artificial intelligence is to develop a framework that combines these three approaches to solve real-life tasks and could utilize many different types of data (unlabeled, labeled, environment exploration and interaction, etc.). Currently, researchers successfully integrated supervised deep learning and reinforcement learning, however to a very limited extent in which deep learning only supports a limited aspect of reinforcement learning (Mnih et al., 2015). A framework in which these three learnings thrive together seems promising.

In addition, analyzing the cognitive development of humankind reveals that a neuro-cognitive revolution about 70,000 years ago, enabled Homo sapiens to conquer the world (Harari & Perkins, 2014). The main feature of Homo sapiens which was developed in this neuro-cognitive revolution is a new and remarkable kind of language which enabled communication and complex cooperation among very large groups of people. Therefore, a machine learning framework that allows communication and collaboration among entities to solve complex problems that require collaboration can create a new model of artificial intelligence with the enormous benefits gained during the neuro-cognitive revolution of Homo sapiens. Each entity might specialize in a specific skill. This framework might be achieved partly by integrating reinforcement, unsupervised and supervised learnings as observed in the human brain.

In conclusion, this article suggests focusing on two frameworks. One, that intertwines reinforcement, unsupervised and supervised learnings utilizing many different types of data (unlabeled, labeled, etc.). Second, that enables communication and complex cooperation among artificial intelligence entities which is the essence of the neuro-cognitive revolution in Homo sapiens.

References

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